SILPHIUM WASIOTENSIS (ASTERACEAE), A NEW SPECIES FROM THE APPALACHIAN PLATEAUS IN EASTERN KENTUCKY

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Knowledge of the presence of an anomalous *Silphium* in the Unglaciated Appalachian Plateaus of eastern Kentucky has existed for over fifty years. This plant was first reported by E. Lucy Braun (1936, 1937) from Clay County, Kentucky as *S. brachiatum* Gattinger. She subsequently compared her specimen with the type collection of *S. incisum* Greene and reinterpreted it as that species (Braun 1940, 1943). *Silphoum incisum* has since been regarded as an aberrant specimen of *S. dentatum* Ell. (Perry 1937); *S. asteriscus* L. ssp. *dentatum* (Ell.) T.R. Fisher & Speer, comb. ined. (Speer 1966) and as *S. mohrii* Small (Cronquist 1980).

Subsequent work in eastern Kentucky has resulted in the location of several populations of the anamalous *Silphium* in Clay, Perry and Pike counties.

Comparison of this Kentucky material with authentic specimens of *S. brachiatum, S. dentatum, S. mohrii* and the type specimen of *S. incisum* indicates that they do not belong with any of those taxa. I am unsure of the correct disposition for *S. incisum* however it is not *S. dentatum* and I am inclined to agree with its interpretation by Cronquist as belonging to *S. mohrii*.

Six years of herbarium and field work have shown that the Kentucky material can be readily separated from similar species by several morphological features including leaf shape, indument, phyllaries, and cypsala characters (Fig. 2). Further it has a disjunct geographical range and a different habitat and geologic substrate from *S. brachiatum* and *s. mohrii*. Hence it is best treated as a new species localized and disjunct from its nearest relatives suggesting that it is a relict. Accordingly the status of endangered is proposed.

SILPHIUM **wasiotensis** M.E. Medley sp. nov. (Fig. 1).

Ex affinitate *Silphium brachiatum*. Caules hispidi; folia opposita, late ovata, grosse dentata, cordata vel subcordata; cypselae laeves angustialatae et cum vel sine incisurae apicales.

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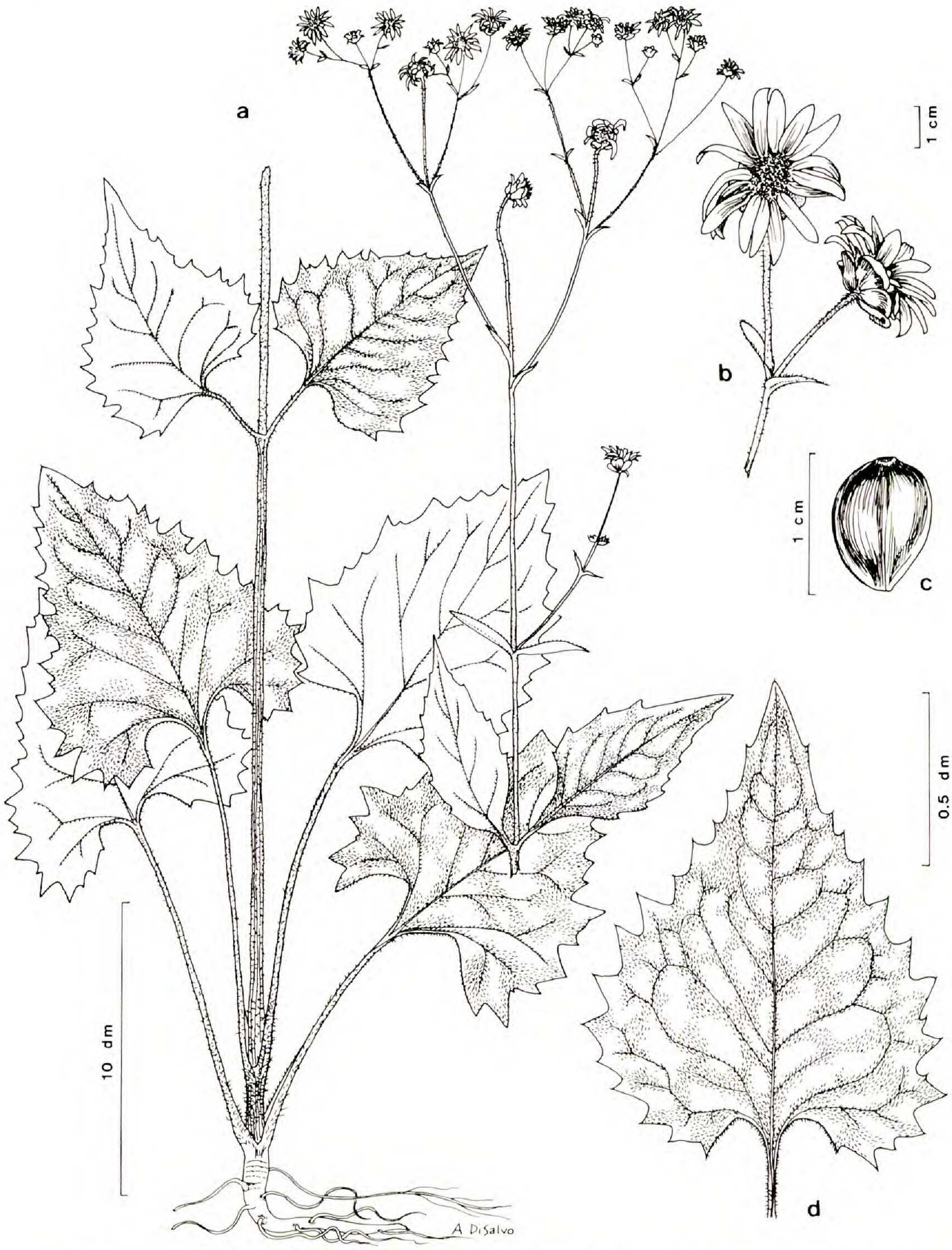

FIG. 1. *Silphium wasiotensis* M.E. Medley. a. Entire plant, b. Flowers, c. Cypsela, d. Lower mid-stem leaf.

Perennial herb, stems erect, 6 – 12 dm tall, hispid, the hairs ca 2 – 3 mm long on the stem base (breaking off with age) and reduced to short stiff hispidulous hairs 1 mm long on the branches of the inflorescence. Leaves simple, opposite, broadly ovate, dentate with large acute teeth, acute apically and with a long-petioled, truncate-cordate base, the two basal pairs 10 – 20 cm wide and 13 – 25 cm long, reduced upwards, and hispid on the petiole (3 – 4 mm on the basal pairs). Inflorescence a brachiate, corymbose panicle; pedicels short-hispidulous, the hairs 1 mm long. Phyllaries glabrous, obtuse, 5 – 10 mm long and 4 – 6 mm wide. Ligules 10 – 15, sunflower yellow (not pale sulfur yellow as in *Silphium mohrii*), 10 – 13 mm long and 1.5 – 2 mm wide. Disk yellow. Cypselas dark, glabrous, narrowly winged (occasionally wingless) and lacking an apical notch or occasionally notched. Plants rhizomatous, with vigorous offshoots forming at the end of rhizomes up to 12 dm long. Flowering in late September.

Since the preparation of the illustration and the initial manuscript I have discovered that in at least a few instances the cypselas have slightly broader wings and a very small apical notch.

TYPE: UNITED STATES. KENTUCKY: **Pike Co.**: Meta 7.5′ Quad., mixed mesophytic forest at head of ravine of Open Fork ca. 0.25 mi E of Meta and then 1 mi SE to end of Open Fork Road, 3 Oct 1984. *Medley 12334-84* (HOLOTYPE and ISOTYPE in the author's herbarium).

Representative Specimens: UNITED STATES. KENTUCKY: **Clay Co.**: opening in dry oak woods at top of steep south – facing ridge, Peabody, *Braun 586* (US). **Perry Co.**: Noble 7.5′ Quad, road bank on KY 476, 0.1 mi S of Rowdy (Stacy), KY at jct. of KY 476 and KY 276, *Medley 11865-84* (EKY, SMU, US).

COMPARISON WITH OTHER SPECIES

Silphium wasiotensis differs from related species in several morphological characters (Fig. 2, Table I). It appears to be closely related to *S. brachiatum* but can be separated by its hispid rather than glabrous stems, leaves more broadly ovate, and short-strigose rather than glabrous, leaf margins with more and much larger teeth, hispidulous rather than glabrous pedicels and shorter branches of the inflorescence. Also, by its larger involucre, larger, obtuse phyllaries and smaller, narrowly winged (or rarely wingless) cypselas, usually lacking an apical notch.

It likewise contrasts with *S. mohrii* which has a densely hispid stem vestiture, alternate, ovate to lance-elliptic, sparsely denticulate to entire, densely long-hispid leaves with obtuse to cuneate bases, densly hispid (2 mm long) rather than hispidulous pedicels and an even broader involucre with hispid, long acuminate, non reflexed phyllaries. Also *S. mohrii* has pale sulfur yellow rather than sunflower yellow ligules and its broadly winged cypselas with an apical notch between two sharp pointed lobes.

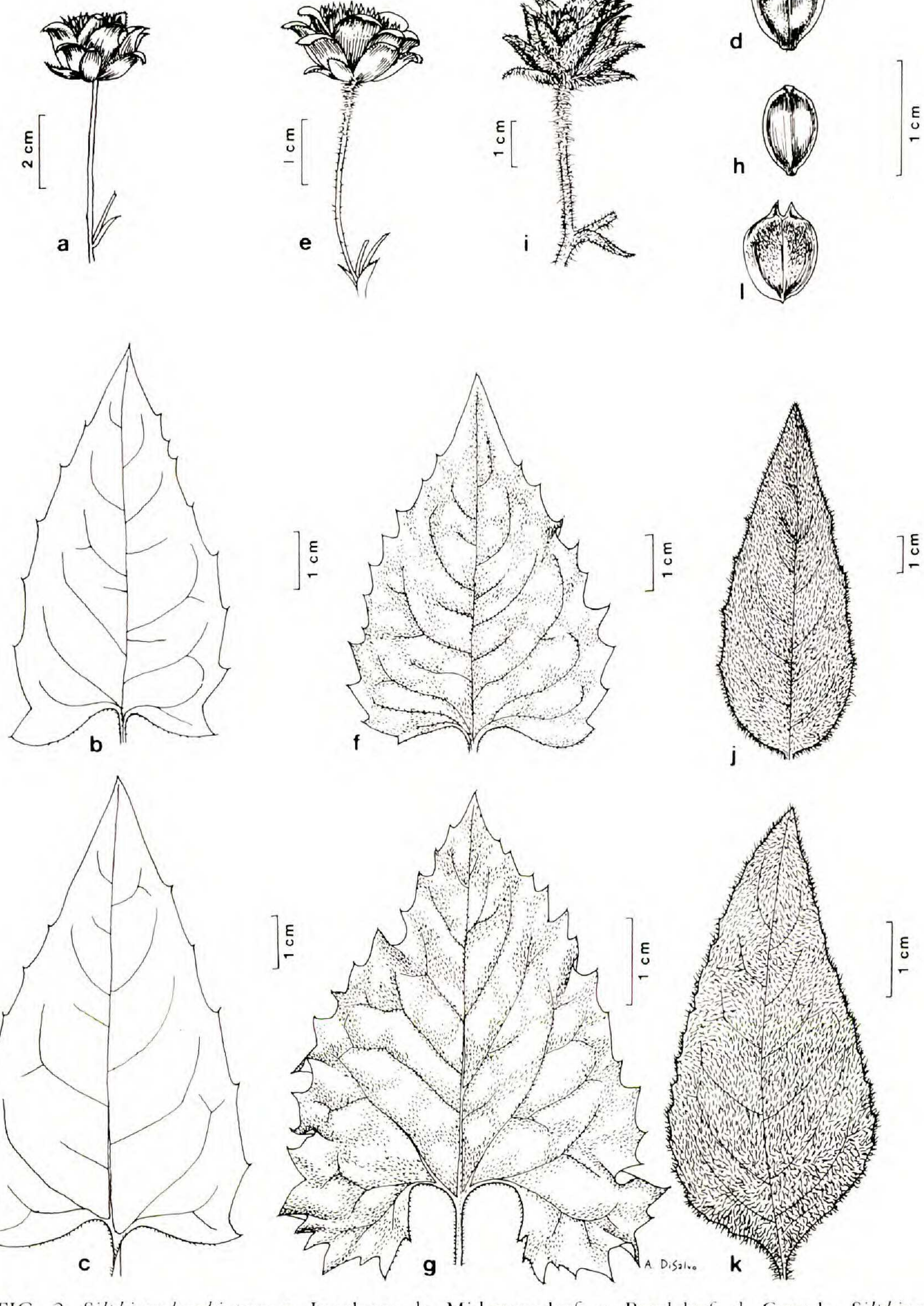

FIG. 2. *Silphium brachiatum*: a. Involucre, b. Mid-stem leaf, c. Basal leaf, d. Cypsela. *Silphium wasiotensis*: e. Involucre, f. Mid-stem leaf, g. Basal leaf, h. Cypsala. *Silphium mohrii*: i. involucre, j. Mid-stem leaf, k. Basal leaf, l. Cypsela.

TABLE 1. Character comparisons of three species of *Silphium*

	S. brachiatum	*S. wasiotensis*	*S. mohrii*
Stem	glabrous	hispid	thickly long hispid
Leaf shape	ovate	broad ovate	ovate-lance elliptic
Leaf base	truncate-sagittate	subcordate-cordate	obtuse to cuneate
Leaf margin	teeth few, small	teeth many, large	teeth few to entire
Leaf surface	glabrous	short strigose	long hispid
Pedicels	glabrous	hispidulous, 1 mm hairs	hispid, 2mm hairs
Phyllaries	glabrous, acute	glabrous, obtuse	hispid, acuminate
Ligules	sunflower yellow	sunflower yellow	pale, sulphur yellow
Cypselas	winged; blunt-lobed apical notch	narrowly winged; usually without apical notch	winged, sharp-lobed apical notch

Silphium dentatum, which is not considered as closely related to S. wasiotensis, differs by having a glabrous, almost glaucous stem, cauline leaves that are similar to the lower ones and not strongly reduced above, the basal leaves often absent at anthesis, and eglandular chaff which is ciliate to pubescent only on the apex. *Silphium dentatum* also has a fewer-flowered, short-branched inflorescence with larger involucres.

HABITAT AND DISTRIBUTION

Silphium wasiotensis is a species of open dry-mesic forest with a sparse shrub layer to mixed mesophytic forest with typical shrub layer and closed canopy. This contrasts with *S. brachiatum* which prefers dry, open, oak-hickory forests and with *S. mohrii* which is found in open dry to seasonally wet barrens and in open oak forest and rocky glades.

Most of the populations of *S. wasiotensis* occur in open to semi-open, dry-mesic mixed hardwood forest with shrubs and herbaceous plants typical of such forests; which sometimes show evidence of past fires. However, one site in Perry County had a mixture of dry and wet mesic species in all vegetative layers of the open forest, and another large population at the type locality in Pike County grows in mixed mesophytic forest with closed canopy in the head of a large, moist ravine.

Silphium wasiotensis is currently known from 13 scattered populations in Clay, Perry, and Pike counties in the Appalachian Plateaus of Kentucky (Fig. 3) on Breathitt (Pennsylvanian) sandstone and shales. Large areas of unpopulated, apparently suitable, habitat occur between the populations. The species will probably eventually be discovered in adjacent Virginia and West Virginia.

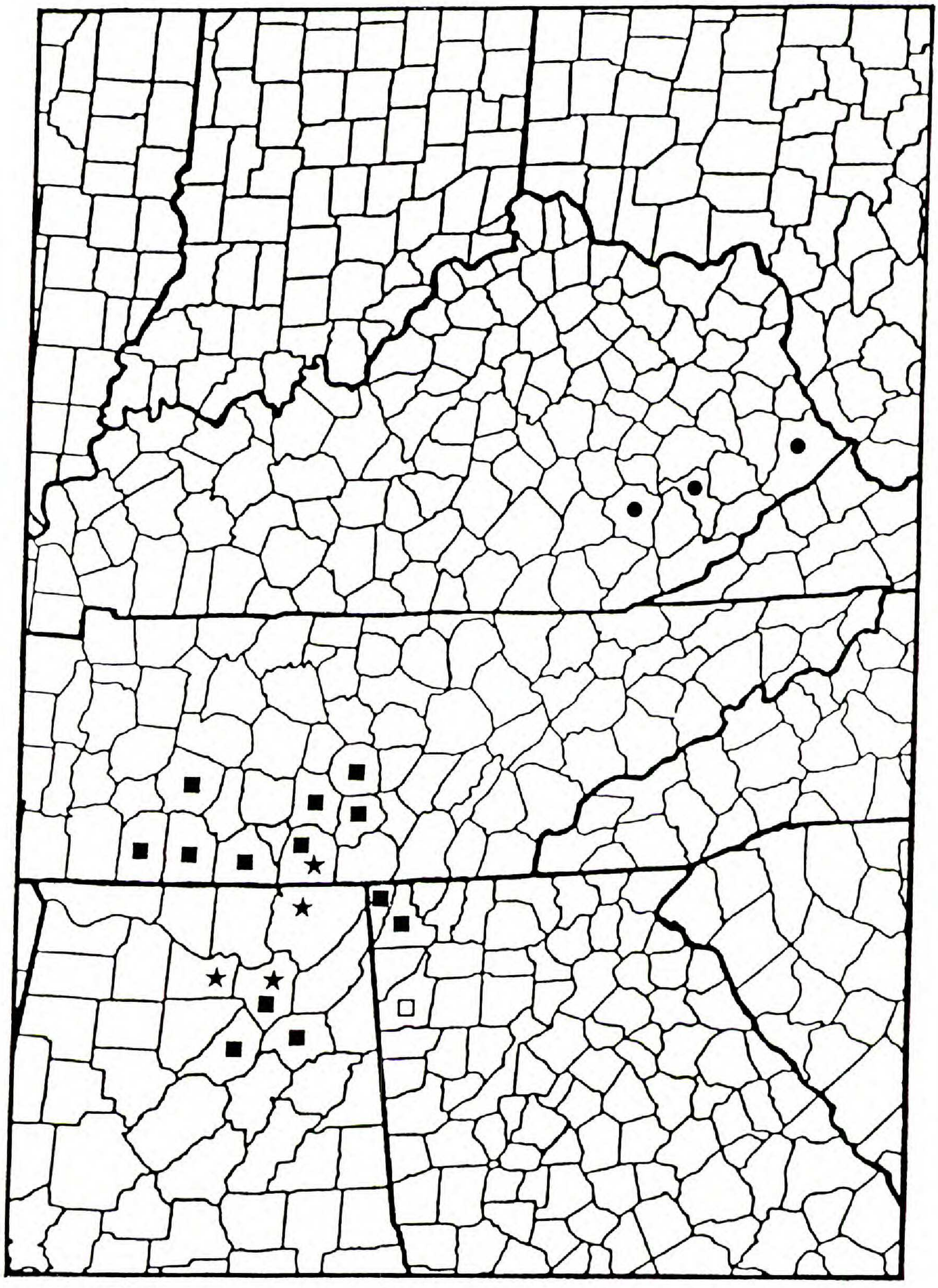

FIG. 3. Distribution of three species of *Silphium* in the southeastern United States. a. *S. brachiatum*, ★ b. *S. mohrii*, ■ c. S. mohrii (*S. incisum*), d. *S. wasiotensis*. ●

The distribution of *S. brachiatum* (Fig. 3) is strongly disjunct southward, on Mississippian limestones of the western margin of the Cumberland Plateau of Alabama and Tennessee. *Silphium mohrii* sensu stricto (Fig. 3) is slightly more widespread in the Southeast over snadstone and limestone occurring in the Ridge and Valley and Appalachian Plateaus provinces and in the Highland Rim Section of the Interior Low Plateaus Province.

The epithet *wasiotensis* is derived from an Indian name (Wasioto) for the general region of the Unglaciated Appalachian Plateaus in Kentucky, West Virginia, Virginia and Tennessee. For those who wish to use a common name, Cumberland Rosinwee is proposed.

The scattered populations, in geologically and geographically restricted ares suggest that *S. brachiatum* and *S. wasiotensis* are relict species, survivors from once wider distributions. The rarity and highly restricted range of *S. wasiotensis* indicates that a formal status of endangered would be appropriate.

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